

Citation:

Francis LA, Lee Y, Birch LL. Parental weight status and girls' television viewing, snacking, and body mass indexes. *Obes Res* 2003;11:143-51.

PubMed ID: [12529497](#)

Study Design:

cohort study

Class:

B - [Click here](#) for explanation of classification scheme.

Research Design and Implementation Rating:

POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To assess whether children's TV viewing was related to their snacking frequency and their intake of snack foods high in fat and sugar content, and in turn, whether greater frequency of snacking promotes patterns of intake that foster overweight in young girls from overweight and non-overweight families.

Inclusion Criteria:

- Living with biological parents,
- Absence of severe food allergies or chronic medical problems affecting food intake,
- Absence of dietary restrictions involving animal products.

Exclusion Criteria:

Of the 183 families at time 3, five fathers (from divorced families) were no longer participating in the study, 2 girls were missing info on TV viewing, 2 girls had extremely high scores on TV viewing and 1 girl showed an extremely high increase in BMI from age 5 to 9 (i.e., outliers)

Description of Study Protocol:

Recruitment – Not specified

Design – Dietary intake, anthropometric, physical activity and demographic measures obtained when girls were 5, 7, and 9 years old, except for TV viewing, which was obtained at ages 7 and 9, and snacking while watching TV, which was obtained at age 9.

Statistical Analysis

- Pearson's zero order correlations – to describe simple relationships among variables
- Path analysis (which uses multiple regression techniques to estimate parameters while controlling for other variables in the model) – to predict the girls' increase in BMI from a

hypothesized set of relationships among variables (Figure 1: TV→Snacking→Fat from ED snacks→BMI) by parental weight status

- χ^2 difference tests after setting each regression path to be equal – to determine differences by parental weight status

Data Collection Summary:

(no blinding)

Independent variables

- Snacking frequency (0 to 4 times/day; food items consumed between 2 consecutive meals as self-reported in dietary recall)
- Snacking while watching TV (no over 3 days; as above which included self-reported location of eating)
- Fat intake from energy-dense snacks (g/d from cookies/pastries, crackers/chips and sweets/confectionaries; three 24-hour dietary recalls with mother present over 2-3 week period, 2 weekdays, 1 weekend day) [Comment: proxy for type of snack]
- TV viewing (mean hrs/day for school and nonschool days; questions to mothers)
- Physical activity (inclination to be active on scale of 1 to 5; 15-item Children's Physical Activity Scale by Tucker [1997])

Dependent variables

- Increase in BMI from age 5 to 9

Control variables

- Parental weight status – non-overweight (both parents' BMI < 25), overweight (one or both parents' BMI ≥ 25) – separate analyses
- Child BMI at age 5
- Family income (when girls 5 y)

Other variables

- Overweight – BMI > 85th percentile
- Obesity – BMI > 95th percentile (international stds of Cole, Bellizzi, Flegal & Dietz, 2000)

Description of Actual Data Sample:

Final sample – 173 girls (72 from overweight families; 101 from non-overweight families)

Original sample – 197 families at time 1, 192 at time 2, 183 at time 3

Age – followed at ages 5 (time 1; mean 5.4 y [summer before kindergarten), 7 (time 2) and 9 (time 3) y

Ethnicity – non-Hispanic white

Other demographics – At baseline, family income \$35 - \$50 K/y, mean age of mothers 35.4 y and fathers 37.4 y, 21% of girls overweight and 4% obese, 52% of mothers and 73% of fathers overweight

Summary of Results:

Differences by parental weight status

- Higher BMI at ages 5, 7, 9 and greater increase in BMI from age 5 to 9 for girls of overweight families (thus BMI at age 5 included as control variable in subsequent analyses)
- Higher fat intakes from energy dense snack foods in girls from overweight families (4.6 vs. 3.0 g)
- No significant differences in TV, inclination to be active, snacking frequency or family income (though trend [$p \leq 0.10$] for TV and snacking to be higher in girls from overweight families)

Correlations with BMI Δ (5-7 y)

- Daily TV (non-overwt only; $R^2=0.29$)
- Fat from snacks (overwt only; $R^2=0.26$)
- Physical activity, snacks in front of TV, snack frequency – NS for both groups

Factors predicting BMI Δ (5-7 y) in multivariate models

- Non-overweight – only daily TV at age 7 ($R^2=0.34$); intake from ED snack foods approached significance [also frequent snacking at age 7 was associated with higher intakes of fat from energy dense snacks ($R^2=0.29$) and daily TV at age 7 associated with snacking at TV at age 9 ($R^2=0.29$)]
- Overweight – more TV at age 7 associated with more snacking at age 7 ($R^2=0.30$) which was associated with higher fat from energy dense snacks at age 7 ($R^2=0.25$) which was associated with greater Δ BMI ($R^2=0.29$); [also daily TV at age 7 associated with snacking at TV at age 9 ($R^2=0.33$), but TV not directly related to BMI Δ]
- χ^2 showed that relationship between TV and snacking frequency and TV and girls increase in BMI were significantly different in girls from overwt vs. non-overwt families

Author Conclusion:

The results of this study support and extend previous findings that have shown that excessive television viewing and snacking patterns are risk factors for the development of overweight in children; however, patterns of relationships may differ based on parental weight status. For overweight families, TV viewing may provide a context for excessive snack consumption, in addition to inactivity.

These findings confirm that TV viewing can indirectly influence children's weight status through effects on food intake [at least for girls from overweight families]. For girls from non-overweight families, TV viewing may increase BMI . . . primarily by decreases in energy expenditure, rather than influences on snacking patterns.

The finding that parental weight status moderated effects of TV viewing and snacking highlights the need to examine contextual family variables that may contribute to differences between overweight and non-overweight families

Reviewer Comments:

Strengths:

- Examines multiple potential interrelated factors
- longitudinal analysis.

Weaknesses:

- No comparison of those included vs. excluded from study,
- homogeneous sample (all white middle-income, well-educated families and only girls),
- no blinding of measurements discussed.

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions

1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	N/A
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	N/A

Validity Questions

1.	Was the research question clearly stated?	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	Was the selection of study subjects/patients free from bias?	Yes
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	Yes
2.3.	Were health, demographics, and other characteristics of subjects described?	Yes

2.4.	Were the subjects/patients a representative sample of the relevant population?	Yes
3.	Were study groups comparable?	Yes
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	N/A
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	N/A
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	N/A
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	Yes
3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	N/A
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	Was method of handling withdrawals described?	Yes
4.1.	Were follow-up methods described and the same for all groups?	N/A
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	Yes
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	Yes
4.4.	Were reasons for withdrawals similar across groups?	???
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	Was blinding used to prevent introduction of bias?	Yes
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	Yes
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	Yes

5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were intervening factors described?	Yes
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	N/A
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	Yes
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	N/A
6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	N/A
6.6.	Were extra or unplanned treatments described?	N/A
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	N/A
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	Were outcomes clearly defined and the measurements valid and reliable?	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	Yes
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	Yes
7.7.	Were the measurements conducted consistently across groups?	Yes
8.	Was the statistical analysis appropriate for the study design and type of outcome indicators?	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes

8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	N/A
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	Yes
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	No
9.	Are conclusions supported by results with biases and limitations taken into consideration?	Yes
9.1.	Is there a discussion of findings?	Yes
9.2.	Are biases and study limitations identified and discussed?	Yes
10.	Is bias due to study's funding or sponsorship unlikely?	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	Yes

Copyright American Dietetic Association (ADA).